Course: Thermodynamics

credits: 5

Course code	CTVH24THERMO
Name	Thermodynamics
Study year	2025-2026
ECTS credits	5
Language	Dutch, with parts in English
Coordinator	M.E.F. Apol
Modes of delivery	Tutorial
Assessments	Fasenleer Theorie - Computer, organised by STAD examinations Thermodynamica Theorie - Written, organised by STAD examinations

Learning outcomes

This module has the following learning outcomes:
- You can perform bubble point, dew point and flash calculations of ideal and non-ideal mixtures based on VLE and Antoine equations.
- You can apply different activity models (such as the 1- and 2-parameter Margules model) in equilibrium calculations, and determine appropriate model parameters from experimental data.
- You can both interpret phase diagrams of binary mixtures (including liquid-liquid de-mixing, and azeotropes with the effect on distillation) and calculate models.
- You describe and use concepts such as energy, heat, work, enthalpy, entropy, free energy and chemical potential in a chemical or chemical-technological context, and calculate the change in these quantities in processes involving changes in pressure, temperature, volume and/or phase state.
- You describe realistic chemical reactions in terms of free energy, enthalpy and entropy, and you predict the location of chemical equilibrium as a function of output composition, pressure and temperature, using tabulated values of the formation enthalpy and absolute entropy.

Content

This module provides an in-depth understanding of chemical thermodynamics and phase theory, crucial concepts for a chemical technologist. Calculations of the vapour pressure liquid-gas equilibrium of systems are the basis for modelling distillation processes.
Specifically, the module covers topics such as reaction heat, chemical work, Gibbs free energy and the location of chemical equilibria, with a strong focus on their application in chemical reactions. In addition, aspects from the process industry are covered, such as mixing and the compression and expansion of gases.

Included in programme(s)

Chemical Engineering

School(s)

Institute for Life Science & Technology

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